

REMARKS

The Examiners rejection of indefiniteness under 35 U.S.C. 112 is traversed. Contrary to the Examiner's arguments, a pore is an empty cavity and does not mean that it is a vacuum. This is the standard use of the term and is clearly set forth in the patents cited. If a pore were not empty it could not be open nor could there be flow therethrough. With regard to the term "substantially empty cavities", it means that the cavities are not filled with liquid or solid material. If a material has a pore size, it means to anyone skilled in the art that these are empty areas or cavities within the material. Thus, claims 18-21 are not indefinite under 35 USC 112, second paragraph.

Claims 1-22 are now rejected by the Examiner as being anticipated under 35 USC 102(a) or obvious by 35 USC 103(a) in view of the reference of Bahten 6,079,662. Bahten '662 is directed toward the packaging and cleaning of previously manufactured porous polymeric products such as semi-conductor cleaning rollers which include a variety of impurities in the finished product.

The previously filed Declaration of Thomas J. Drury in the Preliminary Amendment (Exhibit 1 with attached Exhibits A, B and C) is a verbal summary analysis of a product testing conducted by independent third parties. Exhibit A is a test of applied Materials, a corporation who has leading edge skill and knowledge in the field and ranks as one of the top companies in the world, in the production of silicon wafer processing equipment.

This formal test result on the inventive polyvinyl acetal roller, (3920 - 00307 Type 212) by an entity which would be most critical of the results as they are manufacturer of silicon wafer processing equipment, as the rollers have a direct bearing on the warranty of the equipment. The recommended product life of the rollers used in the manufacturers machines show conclusively that the present invention has three surprising results over the roller products currently being used; (1) the doubling of the effective use life of the roller; (2) a minus defect rate; and (3) a significant reduction of chemical and water usage, any one of which would be a surprising or unexpected result. **A minus defect rate means that the inventive rollers cure manufacturing defects which occur in other areas of the chip manufacture.** The prior art rollers used during the chip cleaning process have positive defect rates meaning that certain percentages of chips were rendered unsuitable for use because of the damage caused by the roller and associated chemical and water used in cleaning. Other testing and comment by those skilled in the art are attached in the declaration as Exhibits B

and C. The inventive semi-conductor roller product was compared with that manufactured by Rippey Corporation which in their best performing product in the semi-conductor roller industry.

Some patents (Bahten) use starch for the pore former while others (Rosenblatt, Cercone) use air as the pore former. These different pore formers are not and cannot be combined. The invention combines all of the good physical attributes of a starch (finite sized pore former) based product such as that made under Bahten with the good attributes of a gas or air (strength, durability) formed product Rosenblatt, Cercone, to produce a product superior to any of the cited prior art. The production of roller products is either by starch or by air and the same are not combined in the manufacturing process.

As previously argued, the Bahten ‘662 reference does not suggest, teach or obviate the present invention. The Examiner has engaged in hindsight application, a prohibited rejection since *John Deere* to combine the cited prior art references against the present invention.

Bahten ‘662 uses starch as the pore former. Many of the pore forming grains (starch) can remain trapped in the material after it is cured and after the material washing, only releasing in use, which causes contamination of the process making a much dirtier sponge. When this product is formed, both sponge and starch combine to make a surface skin. This skin requires that the liquid flow pressure be greater to push the cleaning solution through the brush/roller. This results in higher chemistry (water and chemicals) usage and greater stress and breakdown of the skin material resulting in a shorter use life.

The Bahten ‘662 patent (assigned to Rippey Corporation) is primarily directed toward a packaging for PVA brushes and lists PVA brushes generally. Bahten ‘662 generally states that the pore size (listing a size range for various roller embodiment composition) ranges from about 10 microns to about 200 microns and also notes where the average pore size is less than 10 microns the material may have poor elasticity making the performance fo the cleaning roll unsatisfactory. Bahten ‘662 is does not teach the production of a shaped body, the uniformity and size distribution of the pores and does not teach a uniform pore size within a narrow range as claimed in the present invention. There is no teaching that over 90% of the pores range between 7 and 40 microns or that there is a mean pore size. There is no teaching of the present invention in the Bahten ‘662 reference.

Exhibit B specifically states that the invention brushes clean twice as good as Rippey

brushes and their equivalent. The production of Bahten '662 requires adding a starch to form the pores. It is also noted that other competitive brushes have impurities. Of significant interest is the listing on Col 7 lines 35 -44 of Bahten '662 which notes that the rollers of Merocel Scientific Products (Cercone et al. '573) include a wide variety of impurities that can be detrimental to the manufacture of integrated circuits. As noted on Col. 7 lines 33,34, the Bahten '662 process has a first step of providing a plurality of porous polymeric devices which require cleaning. **These are rollers which have already been manufactured.**

Because Bahten '662 uses starch, twelve additional complex cleaning steps are required after receiving the manufactured product to remove particulate contamination and impurities from the porous polymeric devices so that they can be used for cleaning silicone chips. The devices are noted as being "dirty" from the manufacturing process and should be substantially cleaned before use in the manufacturing operation, e.g. semiconductor fabrication. As noted in Col. 7, lns. 13-15: "The above sequence of steps removes or substantially reduces quantities of ionic contamination and particulate. After cleaning, a preservative of either high pH is added such as ammonium, hydroxide or low pH such as oxalic acid, citric acid and the roller is then packaged. There is no preservative in Applicant's invention and indeed it is noted that the type of preservative depends highly upon the type of porous polymeric material. After the cleaning steps are accomplished, the product cleaned by Bahten still contains a number of impurities which seriously impact on its product life and the defect ratio of silicone wafers. This twelve step requirement is specifically pointed out to show that the roller products of Bahten '662 are inherently dirty which means that substantial impurities would remain after washing as the impurities are held in the foam during curing resulting in a lower life span and use of greater cleaning chemicals. Test results show that such problems are still in existence.

It is, thus, seen that the Bahten '662 reference does not teach or obviate the present invention as it uses different pore forming techniques in the PVA with a resultant wide range of pores and the rollers of other manufacturers. The invention because of its unique specific narrow range of pore sizes and fluid flow characteristics has a life span more than double the rollers presently being used in the marketplace, uses $\frac{1}{2}$ the chemicals and water currently being used by rollers in the field which are used in the marketplace and has a negative defect rate. As previously noted the inventive rollers

when cleaning the silicone wafers do not cause defects as do other competitive rollers but additionally cure manufacturing defects which occur in the production of the silicone wafers. These are all solutions to a long felt need in the industry and are totally unexpected and are surprising results which save large quantities of products, save a significant amount of money in a multibillion dollar industry and have significant environmental benefits.

Applicant would note that nowhere does Bahten '662 teach "bubble point pressure" or "mean flow pore pressure" "cleaning solvent flow rate through the roller" or "dry flow rate" or that the same are accomplished by practicing its teachings. The uniform pore size and porosity is not disclosed by Bahten '662 and the products have not been shown to be identical or substantially identical in structure or that are produced by identical or substantially identical processes. It is also not obvious to reduce formaldehyde to the levels of the present invention. The phrase substantially free from impurities does not teach removing the residual formaldehyde to less than 0.1ppm. Such rejections are pure hindsight rejections based on supposition and not the prior art.

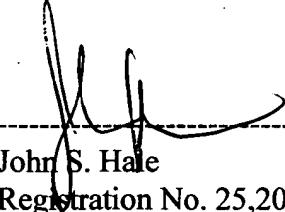
In cases which are similar to the present circumstances, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id. As noted by the court in the case of *In re Clinton*, "Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary." *In re Clinton*, 527 F.2d 1226, 1228, 188 U.S.P.Q. 365, 367 (C.C.P.A.1976).

A three month extension of time together with the fee and Notice of Appeal together with fee is attached. If any additional charges are required, please charge Deposit Account Number 07-1340.

It is respectfully requested that the arguments and amendments present in the present application in condition for favorable reexamination and that the application be passed to issue.

Respectfully submitted,

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